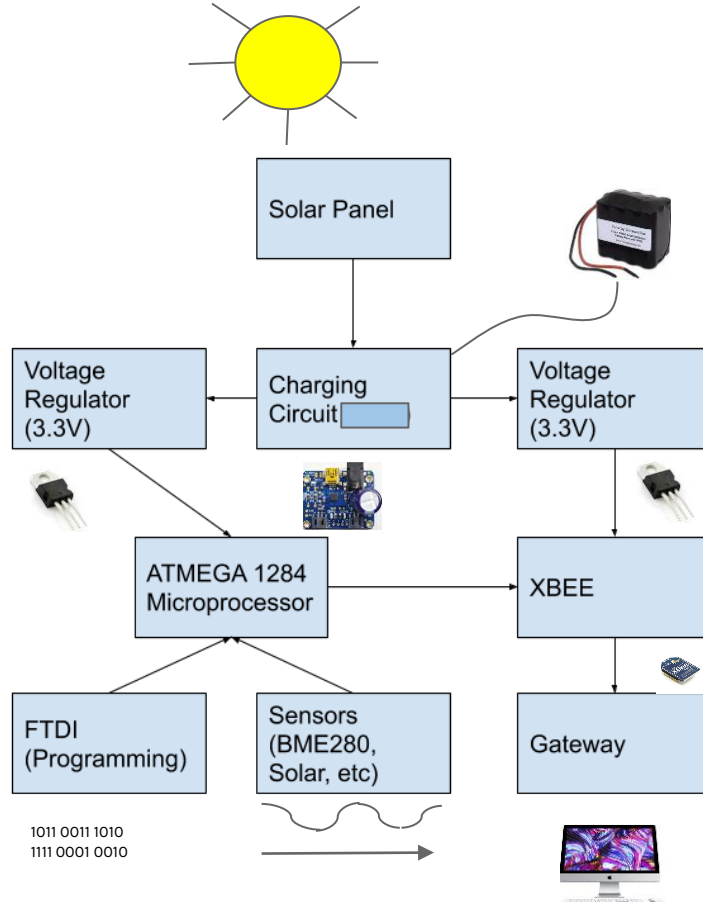# Team Guava

Critical Design Presentation

S20

Presentation Overview

- Block Diagram
- Goals
- Progress
- Pertinent and Potential problems
- Parts List
- Future Work
- Gantt Chart
- Questions

Block Diagram

Project Goals (Before COVID-19)

Produce a self-sustaining environmental sensor module that will collect meteorological data

- Populate and Program Rev D

- Boot-load and program Rev D

- Deploy Rev D

Project Goals (After COVID-19)

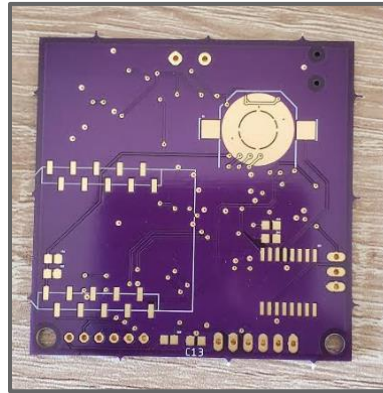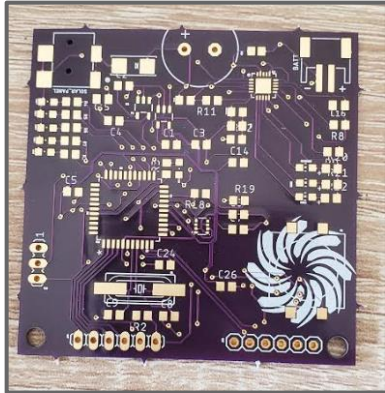Design and research weatherbox implementations through research and analysis.

- Integrate more components

- Wind sensor

- Energy efficiency

- New technologies

Guava **Progress**

Progress since Preliminary Design Review

- Completed REVD design
- Ordered the parts and PCB

Pertinent Problems

- Unable to meet in person
- Don't have the necessary tools or materials to work from home
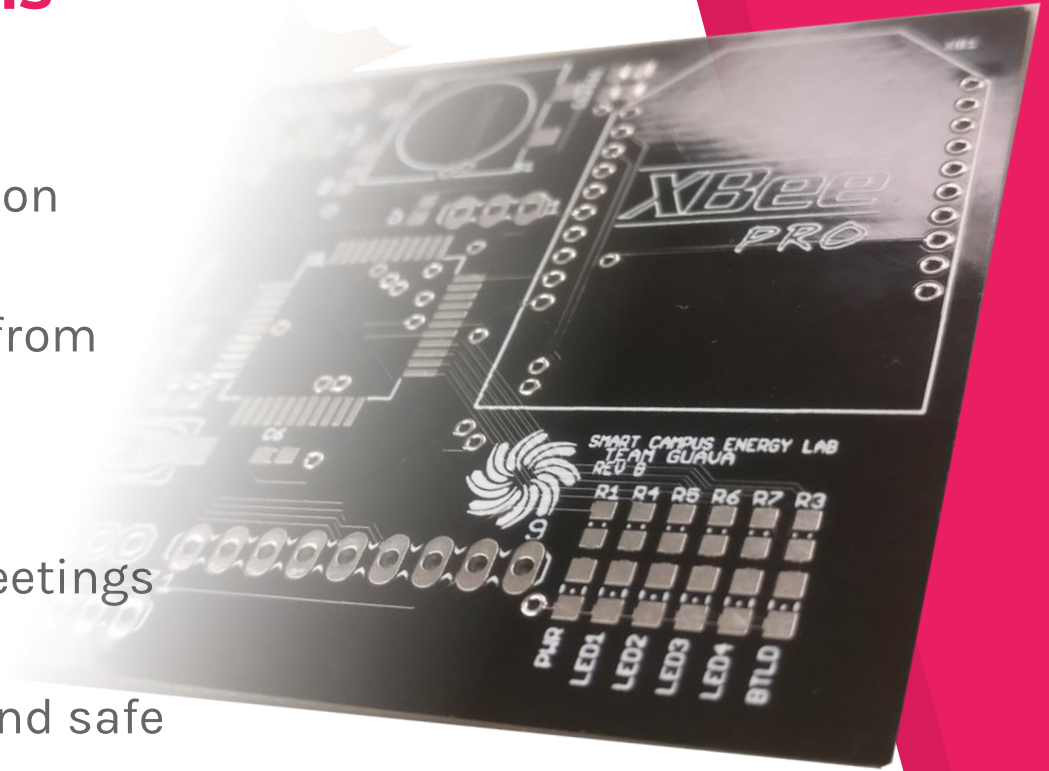
Potential Problems

PCB/Technical

- Faulty board fabrication
- PCB Design
- Getting data to send from our board to Gateway

Non-Technical

- Adjusting to zoom meetings
- No Internet Access
- Not staying healthy and safe

Parts List (Mouser)

Item	Qty	Unit	Part No.	Description	Unit Price	Extension
1	10		815-NTC805103J3450FT	NTC Thermistors 10kOhms +/-5% -55C +125C 200mW	0.17	1.66
2	10		80-ESK478M010AL4AA	Aluminum Electrolytic Capacitors - Radial Leaded 10V 4700uF	0.59	5.90
3	10		604-APT2012LSECKJ4RV	Standard LEDs - SMD 2.0X1.2MM LOW CRNT	0.35	3.52
4	5		579-MCP73871T1AAIML	Battery Management USB/AC Battery Charger w/Pwr Mgmt	1.79	8.95
5	1		700-DS3231SN#T&R-	Real Time Clock Extremely Accurate I C-Integrated RTC/TCXO/	8.64	8.64
6	10		474-COM-12993	SparkFun Accessories Tactile Button - SMD (12mm)	0.60	6.00
7	5		490-PJ-014DH-SMT-TR	DC Power Connectors Power Jacks	0.92	4.60
8	5		12BH022-GR	Cylindrical Battery Contacts, Clips, Holders & Springs CR1612 C	0.97	4.85
9	10		755-SML-H12U8TT86C	Standard LEDs - SMD Red 620nm 40mcd 2.2V; 20mA 0805	0.27	2.74
10	5		556-ATMEGA1284-AU	8-bit Microcontrollers - MCU AVR 128KB FLSH 4KB EE16KB SR	4.76	23.80
11	10		998-MIC5219-3.3YM5TR	LDO Voltage Regulators 500mA Peak 1% Low Noise LDO	0.89	8.90

Subtotal	$	79.56
Tax at _____	$	-
Estimated Shipping		
Total	$	79.56

Parts List (Digikey)

Item	Qty	Unit	Part No.	Description	Unit Price	Extension
1	30		475-1410-1-ND	LED GREEN DIFFUSED 0805 SMD	0.27	8.10
2	10		118-CR0805-FX-1503ELFCT-ND	RES SMD 150K OHM 1% 1/8W 0805	0.10	1.00
3	10		S7039-ND	CONN HDR 6POS 0.1 GOLD PCB	0.53	5.30
4	5		828-1063-1-ND	SENSOR PRESSURE HUMIDITY TEMP	6.55	32.75
5	10		MBR120VLSFT1GOSCT-ND	DIODE SCHOTTKY 20V 1A SOD123FL	0.45	4.50
6	10		RMCF0805JT2K00CT-ND	RES 2K OHM 5% 1/8W 0805	0.10	1.00
8	14		2863S-10-ND	CONN RCPT 10POS 0.079 GOLD SMD	1.70	23.80
9	10		399-7158-1-ND	CAP CER 47PF 500V X7R 0805	0.50	5.00
10						
11						

Subtotal	$	81.45
Tax at _____	$	-
Estimated Shipping		
Total	$	**81.45**

Part List

PCB x5	$46.20
Stainless Steel Stencil x1	$31.32
Mouser	$79.56
Digikey	$81.45
Total	**$238.53**

Introducing
☺ REV D
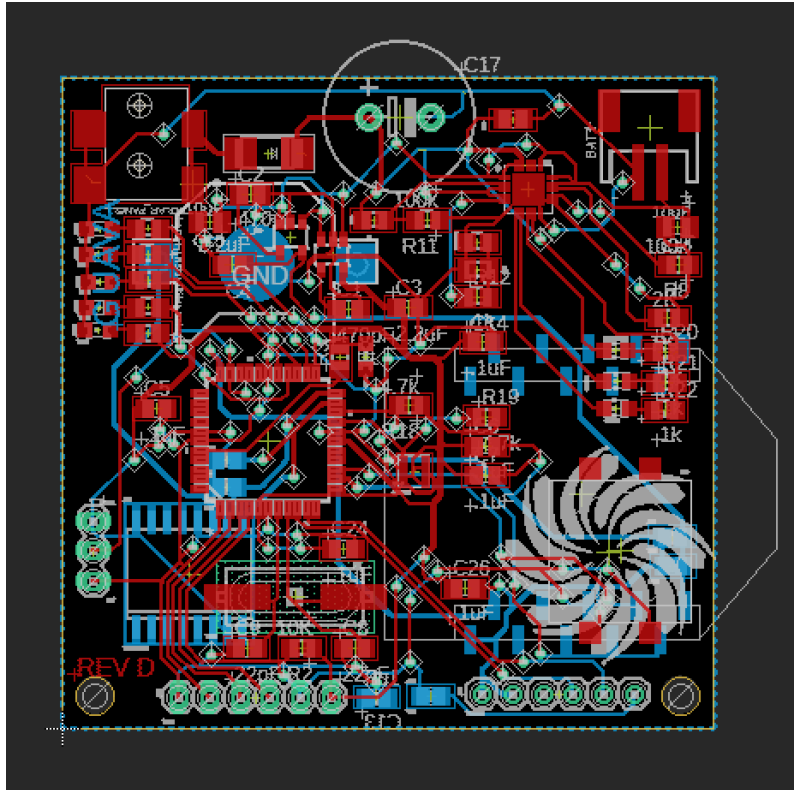
REV D Schematic

- L x W 2.15"x2.15"
- Integrated Charging chip, BME280, RTC
- Headers for Bootloading, programming and XBee
- 3.3V throughout the board
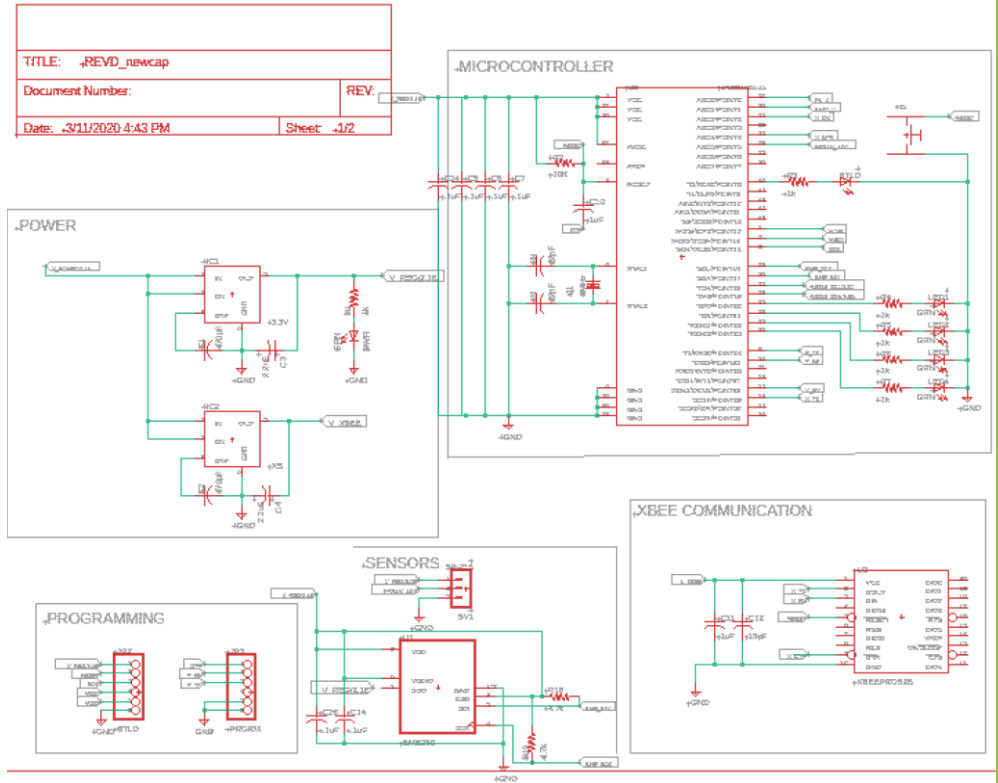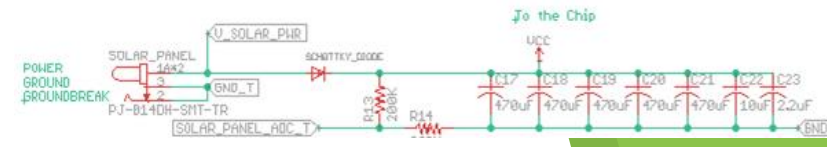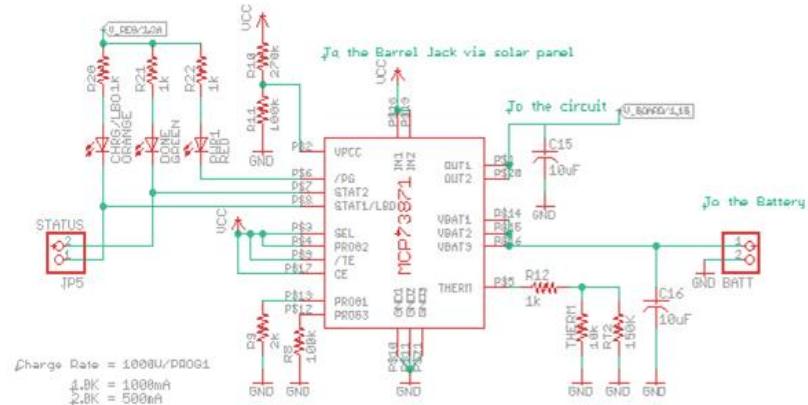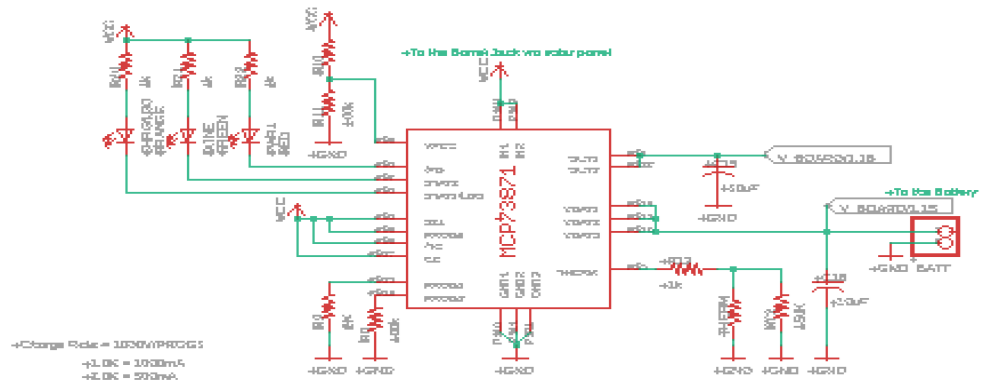
Guava **Progress So Far**

- Properly boot-loaded Atmega1284p (Documented)
- Located trace errors on REV CIV
- Discovered and resolved several issues with solar charging circuit
- Updated Schematic
- Designed REV D Board
- Received REV D and stencil

Future **Work**

Spring 2020

- Research other weatherbox designs
- Brainstorm new methods to improve our design
- Update Team Guava Wiki page with more documentation
- Communicate with Team Firmware about Guava code, XBee packet mismatch with Gateway and friendship

Future Semesters

- Populate, test, and deploy REV D

A

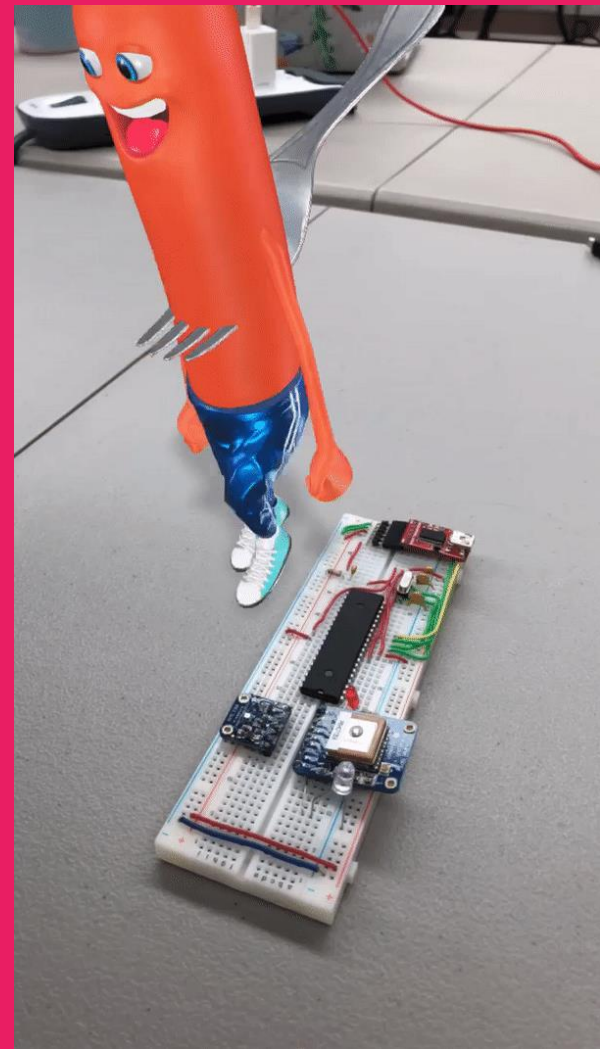| Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Date	1/12 - 1/18	1/19 - 1/25	1/26 - 2/1	2/2 - 2/8	2/9 - 2/15	2/16 - 2/22	2/23 - 2/29	3/1 - 3/7	3/8 - 3/14	3/15 - 3/21	3/22 - 3/28	3/29 - 4/4	4/5 - 4/11	4/12 - 4/18	4/19 - 4/25	4/26 - 5/2	5/3 - 5/9	5/10 - 5/16
Presentation	■									S								
Proposal			■							P								
PDR						■				R								
CDR										I		■						
Final										N						■		
										G								
Review	■	■																
Development			■	■						B								
Deploy										R								
Test & Debug			■	■	■	■	■	■	■	E								
Parts Order and Billing				■	■					A								
Build										K								
Research												■	■	■	■	■	■	■
Documentation												■	■	■	■	■	■	■
Final Report										!					■	■	■	■

(Week 10 column highlighted in red, reading vertically: SPRING BREAK!)

Thank you!
Any Questions?

https://github.com/scel-hawaii/guava

https://wiki.scel-hawaii.org/doku.php?id=weatherbox:guava:start

CREDITS

We used the following free online resources:

- ▸ Presentation template by SlidesCarnival
- ▸ Photographs by Death to the Stock Photo (license)